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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,620	06/24/2003	Jinn-Cherng Yang	3313-1005P	1130
2292	7590	08/27/2004	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			GORDON, RAQUEL YVETTE	
			ART UNIT	PAPER NUMBER
			2853	

DATE MAILED: 08/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/601,620

**Applicant(s)**

YANG ET AL.

**Examiner**

Raquel Y. Gordon

**Art Unit**

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 6/24/2003 (this application).
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>6/24/2003</u> . | 6) <input type="checkbox"/> Other: _____  |

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Moritz, III et al. (US 6042222). Moritz, III et al. teaches every element of the instant invention including:

1. A micro fluidic module for guiding a working fluid supplied by a fluid reservoir, comprising: a micro fluid channel barrier (54, 56), composed of: a firing chamber formed in said micro fluid channel barrier (24) for storing working fluid to be ejected; a fluid inlet channel (50) connecting exterior of said micro fluid channel barrier to interior of said firing chamber (26) and having a wider section at exterior side (54) of said barrier (46) and a narrower section (62) at interior of said firing chamber; a fluid outlet channel connecting said interior of said firing chamber to exterior of said micro fluid channel barrier and having a wider section (Wc) at interior of said firing chamber and a narrower section (62) at exterior side of said barrier (see fig 3); and an actuator (58)<sup>1</sup>, mounted in interior of said firing chamber, for providing pressure to said working fluid (see col 5, ln 64-68);

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<sup>1</sup> It is the Examiner's position element 58 acts as an actuator since the heat from the recited resistor causes ink to be ejected.

Art Unit: 2853

therefore, a part of said working fluid pressurized by said actuator is expelled through said outlet channel from said firing chamber to exterior of said channel barrier; and other working fluid supplied by said fluid reservoir is refilled through said inlet channel from exterior of said channel barrier to said firing chamber (20);

2. A micro fluidic module according to claim 1 wherein said actuator is a heater, supplied by exterior electrical power, for providing thermal energy to said working fluid in said firing chamber and causing said ejection (see col 4, lns 40-46);

3. A micro fluidic module according to claim 1 wherein said actuator is made of piezoelectric material<sup>2</sup>.

4. A micro fluidic module according to claim 1 wherein said micro fluid channel barrier is a polygonal body (see fig 4, elements 54, 56);

5. A micro fluidic module according to claim 1 wherein said firing chamber is a polygonal cavity (see elements 54-56 and see fig 4);

6. A micro fluidic module according to claim 1 wherein said micro fluid channel barrier comprises multiple fluid inlet channels for increasing refilling speed of working fluid from exterior of said channel barrier to said firing chamber (20);

Art Unit: 2853

7. A micro fluidic module according to claim 1 wherein said micro fluid channel barrier comprises multiple fluid outlet channels for increasing expelling speed of working fluid from said firing chamber to exterior of said channel barrier (see col 5, ln 64-66 and col 6, ln 43-47)<sup>3</sup>;

8. A micro fluidic module according to claim 1 wherein said micro fluid channel barrier comprises a plurality of fluid firing chambers each having at least an inlet channel and at least an outlet channel connecting between said firing chambers and exterior opposite sides of said micro fluid channel barrier (see fig 3 and 4);

9. A micro fluidic module according to claim 8 wherein said inlet channel and said outlet channel of each firing chamber have convergent sections to get a one-way consistent fluid flow passing through said firing chamber; said fluid flow for adjacent firing chambers are opposite to each other so as to form an S-shape fluid flow (see fig 4);

10. A micro fluidic module for guiding a working fluid supplied by a fluid reservoir, comprising: a plurality of micro fluid channel barrier (54, 56), each composed of: a firing chamber formed in said micro fluid channel barrier (24) for storing working fluid to be ejected (see fig 3); at least a fluid inlet channel (50)

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<sup>2</sup> The heat resistor recited in col 4, lns 40-50 anticipates a piezoelectric device since the stress causing expansion of the vapor bubble is subjected to the recited current source.

<sup>3</sup> It is the Examiner's position, while the "refill" speed slows down (see col 4, ln 65-col 5, ln 7) at the feed channel due to constriction 62, at the nozzle exit, the constriction causes a higher pressure contributing to a faster flow rate at the exit (see fig 4, to the right of 62).

Art Unit: 2853

connecting exterior of said micro fluid channel barrier to interior of said firing chamber (26) and having a wider section at exterior side (54) of said barrier (46) and a narrower section at interior (62) of said firing chamber; at least a fluid outlet channel connecting said interior of said firing chamber to exterior of said micro fluid channel barrier and having a wider section (Wc) at interior of said firing chamber and a narrower section (62) at exterior side of said barrier (see fig 3); and a plurality of actuators<sup>4</sup>, each mounted in interior of said firing chamber, for providing pressure to said working fluid (see col 5, ln 64-68); therefore, parts of said working fluid pressurized by said actuators are expelled through said outlet channels from said firing chambers to exterior of said channel barriers; and other working fluid supplied by said fluid reservoir is refilled through said inlet channels from exterior of said channel barriers to said firing chambers (20).

11. A micro fluidic module according to claim 10 wherein said actuators are heaters, supplied by exterior electrical power, for providing thermal energy to said working fluid in said firing chambers and causing said ejection (see col 4, ln 40-46);

12. A micro fluidic module according to claim 10 wherein said actuators are made of piezoelectric material<sup>5</sup>

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<sup>4</sup> It is the Examiner's position element 58 acts as an actuator since the heat from the recited resistor causes ink to be ejected.

Art Unit: 2853

13. A micro fluidic module according to claim 10 wherein a fluidic outlet channel of a fluidic channel barrier corresponds to a fluid inlet channel of an adjacent fluidic channel barrier (see fig 3);

14. A micro fluidic module according to claim 10 wherein a fluidic inlet channel of a fluidic channel barrier corresponds to a fluid outlet channel of an adjacent fluidic channel barrier (see fig 3);

15. A micro fluidic module according to claim 10 wherein one side of said fluidic channel barrier is formed with said inlet channel and said outlet channel (see fig 3);

16. A micro fluidic module according to claim 10 wherein said micro fluid channel barriers are arranged in a matrix (see fig 3);

17. A micro fluidic module according to claim 10 wherein said micro fluid channel barriers are polygonal bodies (see elements 54, 56, and see fig 4);

18. A micro fluidic module according to claim 10 wherein said micro fluid channel barriers are arranged in a faveolate construction (see fig 4);

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<sup>5</sup> The heat resistor recited in col 4, lns 40-50 anticipates a piezoelectric device since the stress causing expansion of the vapor bubble is subjected to the recited current source.

Art Unit: 2853

19. A micro fluidic module according to claim 10 wherein said firing chambers are polygonal cavities (see elements 54, 56, and see fig 4).

***Contact Information***

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Raquel Y. Gordon, whose telephone number is (571) 272-2145. The Examiner can normally be reached on M Tu Th and F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. A fax number is available upon request.

Any inquiry of a general nature or relating to the status of this application or proceeding may be directed to the Examiner or Supervisor.



Raquel Y. Gordon  
Primary Examiner  
Art Unit 2853  
August 16, 2004

**RAQUEL GORDON  
PRIMARY EXAMINER**